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The Burden of Celebrity:
The Impact of CEO Certification Contests on CEO Pay and Performance

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ABSTRACT

In this study, we use the results from Financial World’s widely publicized CEO of the Year contest to investigate the impact of CEO certification contests on firm performance and executive compensation. We find that certified CEOs receive higher compensation than non-certified CEOs when performance is high but lower remuneration when performance is poor. While certifications appear to generate positive abnormal returns when they are first announced, the longer term impact of CEO certifications appears to be negative.
Scholars have noted that it is often difficult to determine whether a firm’s performance is driven by the excellence of its top management team or general economic and organizational conditions that bear little relation to managerial competence (e.g. Bok, 1993; Holmstrom, 1982; March, 1984). Holmstrom (1982), for example, argued that attributions of managerial ability are problematic because organizational performance is affected not only by the local decisions of management, but also by systematic risk factors operating at the industry and organizational level. This ambiguity is compounded by the fact that top managers may, indeed, have only a limited impact on their firms (Lieberson & O’Connor, 1972; Salancik and Pfeffer, 1977). A firm’s current good fortune may be a result of a favorable industry environment or the foresight of past managers who have since left the organization. Conversely, poor performance may stem from uncontrollable economic downturns or deteriorated corporate conditions inherited from predecessors. Further complicating this issue is research suggesting that managers tend to rationalize past events so as to cast their actions in the best possible light. This research has shown that poor company performance is often blamed on uncontrollable external events while good performance is credited to the foresight and quality of management (Bettman & Weitz, 1983; Salancik & Meindl, 1984). The uncertainties surrounding the impact of top managers imply that it is quite difficult to evaluate managerial effects in an isolated and individualized context.

Under these conditions of evaluative uncertainty, organizational research suggests that social devices are often invented at a collective level to assess the abilities of actors by creating a competency ordering among them. Recent research has suggested that the financial press may play an important role in constructing such orderings by publicizing and interpreting organizational performance information (Deephouse, 2000; Johnson, Ellstrand, Daily & Dalton,
Indeed, media-based interpretations are sometimes embedded in “certification contests” through which actors are evaluated relative to one another in such a way that high performers are identified and capture the endorsements of reputable third parties (Rao, 1994; Scott, 1994). By certification contest we mean a contest in which actors in a given domain are ranked based upon performance criteria that are accepted by key stakeholders as being credible and legitimate. Such contests are common in many organizational settings and have important effects upon an actor’s reputation. *Fortune* magazine, for instance, annually ranks companies based on their public reputations, and *US News and World Report* publishes a highly influential ranking of business schools.

Certification contests are useful measures of status in organizational communities because they combine many individual judgments on uniform criteria, thus enabling summary comparisons among the rated actors (e.g., Fombrun, 1996; Rao, 1994). Fombrun (1996) suggested that stakeholders prefer organizations to be publicly evaluated even if the evaluative criteria are not completely comprehensive. The resulting rankings are important because of the behavioral effects that they have on organizations and their stakeholders (e.g., Elsbach & Kramer, 1996). Indeed, it is particularly important in uncertain environments for judgments to be made on quality. It is in such environments that certification contests are most likely to arise.

Prior research on certification has focused on the linkage between organizational quality rankings and organizational outcomes such as survival and performance (Rao, 1994). In this paper we extend this literature by examining the certification of individual managers and its effects on both organizational and individual level outcomes. In particular, we examine the impact of a well-known certification contest in the managerial realm that identifies star CEOs. We first investigate whether firms can gain value by employing a top executive who has been
anointed a star performer by expert observers. On the one hand, there is good reason to believe that employing a star CEO could be valuable to a firm. As Fombrun (1996) noted, having a highly recognized CEO at the helm may reassure stakeholders that the firm’s future prospects are bright and, in turn, enhance the firm’s ability to attract higher quality employees, increase their leverage over suppliers, and gain better access to needed capital. On the other hand, there are arguments in the management literature suggesting that CEO star status brings with it negative consequences for firms such as managerial overconfidence that may have detrimental effects on future performance. We investigate all of these possibilities in the present research.

We also investigate how being anointed a star CEO influences important personal outcomes for the CEO involved; specifically, his or her total compensation. Frank and Cook (1995) suggested that a “winner-take-all” compensation effect exists among corporate executives in that being certified as a star CEO has important positive effects on annual compensation over and above any actual performance differences between stars and non-stars. Moreover, research has also suggested a “Matthew effect” (Merton, 1968) in that high-status actors may receive greater rewards for performing similar or even identical tasks (Podolny, 1993; Rao, 1994).

At the same time, however, we also examine whether there is a personal dark side to being recognized as a high status actor. Fombrun (1996) suggested that being publicly identified as a star carries with it the “burden of celebrity.” If the CEO certification process creates expectations that future firm performance will be high, CEOs may suffer negative outcomes if these expectations are not met. This effect is theoretically important because there is a good deal of evidence that CEO pay and corporate performance are only loosely coupled (e.g., Bebchuk & Fried, 2004; Tosi & Gomez-Mejia, 1989). CEO certification contests may be one social mechanism that has evolved to "re-couple" CEO pay and performance.
In order to explore these issues, we use the results from a widely publicized annual contest conducted by Financial World magazine from 1975-1996 that identified exemplary CEOs by surveying over one thousand peer CEOs and business analysts. Thus, the contest provided a visible and public assessment of the general esteem with which a corporate leader was held by experts who served on his or her boards, competed against him or her on a daily basis, or bought and sold his or her company’s stock. CEOs were rated on a variety of financial and non-financial criteria and then ranked on the basis of these ratings. Selected CEOs were then awarded bronze, silver, and gold medals as a function of their place in this ranking. The results of the contest were publicized in Financial World’s March issue each year and a dinner was organized in New York City to honor the medal winners.

**THEORY AND HYPOTHESES**

The uncertainty surrounding the impact of top managers on the performance of firms has stimulated a good deal of scholarly interest in the symbolic aspects of senior leadership (e.g., Pfeffer, 1981), under the assumption that the actions of CEOs are embedded within a socially constructed system of interpretations and opinions (e.g., Hayward, Rindova & Pollock, 2004; Khurana, 2002). Some research has approached this topic from the perspective of managers constructing self-attributions for corporate performance (e.g., Bettman & Weitz, 1983; Salancik & Meindl, 1984) and has shown that managers tend to externalize failure and to internalize success. Other research has focused on the interpretations of external actors such as the business press (e.g., Chen & Meindl, 1991; Hayward et al., 2004; Meindl, Erlich, & Dukerich, 1985) and corporate boards (e.g., Wade, Porac, & Pollock, 1997; Khurana, 2002) and has demonstrated that these interpretations are similarly subject to a number of cognitive and political influences. These influences aside, however, the impact of top managers on firm performance must be
assessed for very practical reasons and must be factored into any number of personnel decisions, not the least of which is how to compensate top managers for their contributions to their firms. These pragmatic issues have been largely overlooked by researchers studying the symbolic aspects of senior leadership, raising the question of the extent to which personnel decisions are independent of the contributions of management or are linked in predictable ways to management quality.

Organizational researchers have argued that, under conditions of evaluative uncertainty, one mechanism by which the capabilities of social actors are assessed is through certification contests and endorsements from reputable third parties (Scott, 1994; Rao, 1994). Wiley and Zald (1968) argued, for instance, that organizational survival and access to resources is enhanced by public accreditation. Similarly, Wilson (1985) suggested that a firm could lower its cost of capital by having its financial statements certified by reputable auditors. Singh, Tucker and House (1986) found that voluntary social service organizations that received a registration number and were listed in the Community Directory of Metropolitan Toronto enjoyed greater legitimacy and were less likely to fail. In the early auto industry, Rao (1994) found that organizations whose automobiles won speed and reliability contests had improved chances of survival. In all of these contexts, being certified in an uncertain environment served as a signal that an actor was of high quality and likely to survive in the long run.

CEO Certifications and Firm Performance

Certification contests that identify high performing CEOs may play a similar role in the corporate governance arena. Research on governance has shown that financial markets do attend to who occupies the executive positions in public corporations (e.g., Worrell, Davidson, & Glascock, 1993). Thus, employing a publicly certified CEO might be expected to yield tangible
performance benefits to a firm by signaling that the CEO is of high quality and likely to add economic value to the company. In this vein, Deephouse (2000: 1098) has argued that “reputation facilitates value creation by signaling to current and potential exchange partners, including employees, suppliers, investors, and customers.” Winning a certification contest may enhance a CEO’s reputation and thus increase the firm’s credibility in the eyes of key stakeholders (Hall, 1992; Fombrun, 1996). This credibility, in turn, could, among other things, make stock offerings more desirable or attract higher quality employees. Employing a certified CEO may also allow a firm to enjoy cost savings. First, the status associated with positive certifications may lower a firm's cost of capital. Fombrun & Shanley (1990) showed that the terms for acquiring capital were more favorable for higher status firms. Second, to the extent that certification contests positively influence the perception of a firm’s future prospects, it may lower suppliers’ perceived risk in transacting with the firm. For example, Podolny (1993) suggested that the status of underwriters affects the due diligence costs of investment banks. The costs savings for transacting parties in this instance makes the high-status partner more attractive.

Along similar lines, being publicly certified as a competent manager may enable a CEO to translate the credibility of being anointed a star into power when dealing with internal and external constituencies. Specifically, being certified as a star CEO may increase a CEO’s prestige power. Finkelstein notes that, “Prestige power is related to a manager’s ability to absorb uncertainty from the institutional environment (1992: 515).” One way in which managers can influence their prestige power is through building a positive reputation among stakeholders (Dalton, Barnes, & Zaleznik, 1968). As certification is awarded by expert stakeholders, it would seem to confer a positive institutional reputation and lead to increased prestige power for the
anointed star. Similarly, Hayward and colleagues (2004) proposed that star CEOs and key stakeholders embrace, rather than reject, a CEO’s celebrity status and view it as a valuable intangible asset for the firm. Hayward et al. posited that, as a result, such CEOs will enjoy wider discretion and assert even greater control over the firm as these awards reinforce both the efficacy of the star CEO as well as the notion that he or she enhances the firm's performance. Given that strategic decisions are unstructured and replete with ambiguities (Mintzberg, Raisinghani, & Theoret, 1976), and therefore invite the use of power, the influence that star CEOs gain from public recognition may allow them to leverage their knowledge and skills more effectively and positive firm outcomes may result. The effects of CEO certification on both stakeholder perceptions and CEO job performance lead to the following hypothesis:

**Hypothesis 1a:** CEO certifications will be positively associated with a firm’s future performance.

In contrast to the above positive signaling effects of certification, some evidence from the organizations literature also suggests the possibility that CEO certification could be detrimental to future firm performance by inducing overconfidence and hubris in CEOs anointed as stars. This research has suggested that CEOs who have been successful in the past sometimes become overly confident in their abilities and actions, and that this hubris leads to suboptimal decisions. Hubris is defined as “exaggerated pride or self-confidence” (Hayward & Hambrick, 1997: 106). Hayward & Hambrick (1997) found that CEO hubris, as measured by recent media praise of the CEO, led to both the payment of higher premiums for corporate acquisitions and higher shareholder losses from these acquisitions. The authors argued that CEOs’ over-confidence in their acquisitions was a direct outcome of the media praise these celebrity CEOs received. If being certified as a star CEO makes it more likely that an executive will become overconfident
in his or her decisions and actions, certification may also lead in some cases to overly risky and ill-advised choices. These arguments lead to the following alternative hypothesis:

**Hypothesis 1b:** CEO certifications will be negatively associated with a firm's future performance.

In investigating the effects of CEO certification on firm performance we examine market returns and accounting returns in the year following the award. Although prior research does not provide much basis for distinguishing the effects of certification on these different performance metrics *ex ante*, it does seem reasonable to expect that such differences may exist. That is, CEO certification may have different effects on market returns versus profitability. Although we do not specifically hypothesize these relationships, we investigate them in the present study.

**CEO Certifications and CEO Compensation**

According to Crystal (1991), many corporate boards believe that high pay for star CEOs is a wise investment in managerial talent. It is this belief that substantiates the claims by corporate investors such as Warren Buffett that,

“You’ll never pay a really top-notch executive…as much as they are worth. A million, $3 million, or $10 million, it’s still peanuts” (Forbes, May 28, 1990: 210).

Crystal (1991) described this ideology well by noting that:

“A perennial debate in history circles centers on whether great men, like Napoleon, really can change the course of history, or, alternatively, whether history unfolds in a mysterious process that is only marginally influenced by the Napoleons of this world. Ask your typical board of directors to jump into the debate among historians, and to a man…they will vote with the ‘great man’ camp. To them, it is self evident that if you put the right person in the CEO’s job and make sure he stays in the job, great results will ensue. And to make sure he stays in the job, pay him anything he requires, short of the entire sales volume of the company” (p.159).

The insight behind Crystal’s observation is that, regardless of whether a CEO’s marginal contribution to a firm justifies his or her salary, boards of directors often believe that CEOs do great things that warrant high pay, and this perception rules the compensation setting process.
However, for the many reasons noted above, a CEO’s marginal contribution to firm performance is difficult to assess, and thus board beliefs about this contribution are contestable by powerful shareholders, the business press, and the public at large. It is because these beliefs are contestable that CEO certifications act as useful cues about the competence of managers. Indeed, stakeholders may heavily weight the outcomes of certification contests when evaluating a CEO’s talent because such contests are likely to be perceived as one of the few relatively neutral sources of information about a CEO’s contribution to the firm. This is consistent with Khurana’s (2002) argument that stakeholders overweight external cues of a CEO’s reputation in their evaluations of his or her talent as well as with Frank and Cook’s (1995) suggestion that performers who are publicly recognized as stars collect compensation premiums that are higher than their marginal contributions would justify. These arguments are also consistent with the Matthew effect (Merton, 1968) in that high-status actors receive higher rewards for performing similar or identical tasks. Certified CEOs may be able to leverage their high-status in negotiating future compensation contracts with the board, or board members may simply feel justified in paying star CEOs higher compensation due to reduced uncertainty about the quality of the CEO.

The fact that CEO certification contests are sponsored by the media may be important in this regard. Hayward et al. (2004) suggested that journalists often over-attribute firm outcomes to the actions of the CEO and play a crucial role in creating CEO celebrity. Flattering media accounts about medal winning CEOs may encourage boards to believe in the distinctive ability of winners and thus grant higher compensation to managers certified in the press. We therefore hypothesize:

*Hypothesis 2: CEO certifications will be positively associated with CEO compensation.*
While H2 predicts that winning a medal will have a positive main effect on a CEO’s compensation, his or her compensation may also depend on the firm’s subsequent performance. Meindl et al. (1985) found that poor firm performance is often attributed to shoddy leadership, while exemplary performance is often credited to the diligence and wisdom of the CEO, regardless of whether his or her actions are closely linked to these performance outcomes. In addition, Hayward and colleagues (2004) proposed that celebrity CEOs actively embrace and cultivate their celebrity by taking credit for their success and attempting to capture greater control of the firm. By embracing their celebrity, star CEOs may, in effect, publicly reinforce the perceived cause and effect relationship between their actions and firm performance.

Combined, these ideas suggest that winning a certification contest makes it more likely observers will attribute the firm’s outstanding prior performance to CEO actions rather than to external causes, and that the CEO will attempt to exert greater control on the firm. If subsequent firm performance is high after a CEO has been publicly recognized as competent, these earlier attributions will be reinforced. Thus, CEOs of high performing firms who have been certified in previous years may obtain a compensation premium because their board of directors is likely to attribute the firm’s continuing favorable outcomes to the CEO’s wisdom and competence.

At the same time, these attributional tendencies may make it quite difficult for a certified CEO to construct credible accounts that deflect blame to external sources when subsequent firm performance is poor (Ginzel, Kramer & Sutton, 1992). Attempts by management to link later poor performance to external causes are thus likely to be viewed as less credible, especially if the star CEO has embraced and cultivated his or her own celebrity (Hayward et al., 2004). Consequently, when a firm’s performance is poor, CEOs who have won certification contests in the past may actually be held more responsible and receive lower compensation than non-
certified CEOs whose firms achieve similar levels of performance. Thus, being recognized as a star CEO may be a double-edged sword and may carry with it the “burden of celebrity” (Fombrun, 1996). This line of reasoning suggests the following hypothesis:

_Hypothesis 3: Certifications in the past will be positively associated with a CEO’s compensation when the firm’s subsequent performance is high and negatively associated with his or her compensation when the firm’s subsequent performance is poor._

**DATA AND METHODS**

**Data**

Our sample was selected from the companies that were members of the S&P 500 at the end of 1992. The original sample included the 366 companies that had fiscal years ending on December 31st. We selected this date to avoid any sampling problems which might arise from different fiscal years such as significant changes in the market environment in the non-overlapping periods. Missing data reduced our sample to 278 companies. T-tests revealed no significant differences between our sample and the S&P 500 as a whole along such dimensions as size, performance, and industry representation. Firms in our sample varied in size, ranging from $154 million to $351 billion in total assets. To test our hypotheses we gathered panel data for the five years starting in 1992 and ending in 1996. We began our sample in 1992 because it was during this year that the SEC significantly increased its reporting requirements with regard to CEO pay policies. Firms were systematically required to report all elements of a CEO’s compensation. Starting the sample in 1992 made it possible to collect total compensation data for each CEO and ensured that the firms faced a common regulatory environment over the time period. In cases where there was a CEO succession during the year, we kept the CEO who was replacing the departing CEO in our sample, unless he was appointed CEO after October of the current year. We also omitted from our sample firm years in which the CEO had not been at the
firm in some capacity for the full year. As we report below, we performed a variety of sensitivity analyses to ensure that our selection criteria did not affect the results.

**Dependent Variables**

**Firm Performance:** We assessed both the immediate reaction and longer-term effects of firm certification on performance. In order to measure the immediate reaction of the stock market, we examined the impact of winning a medal on a firm’s excess returns in the days immediately following the announcement of the medal. For longer-term performance, we used both an accounting and a market measure to assess each firm’s annual performance from 1992 through 1996. We obtained a measure of compounded market returns that consisted of the total yearly stock return of the company, assuming reinvestment of dividends \((\text{Price}_{\text{end}} - \text{Price}_{\text{beg}} + \text{Dividends})/\text{Price}_{\text{beg}}\). We also obtained annual return on common equity (ROE) which is a measure of how well a company is using the equity provided by stockholders (Teitleman, 1996) and is commonly used as a basis for awarding incentive pay. Both performance measures were obtained from the COMPUSTAT database.

**CEO Compensation:** We gathered data on compensation from the EXECOMP database. Because CEO compensation takes a wide variety of forms (Bebchuk & Fried, 2004) we used a CEO's total direct compensation as our compensation measure. A CEO’s total direct compensation included salary, bonus, the value of restricted stock grants, options granted during the year (valued by the Black-Scholes method\(^1\)), long term incentive payouts that year, and all other types of cash compensation paid in that year. As in other studies, this variable was transformed into its natural logarithm so that extreme values would not unduly bias the analysis.

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\(^1\) While we do recognize that the valuation of stock options can be problematic, previous research has shown that various option-pricing methods produce results that are very highly correlated \(r=0.90\) (Sanders, Davis-Blake, Fredrickson, 1995). This high correlation, combined with the fact that the Black-Scholes method is the most widely
Independent Variables

CEO certification: We assessed CEO certification using the results of Financial World’s annual CEO of the Year competition. Financial World began this widely publicized annual contest in 1975 and it was continued until 1996. Each year the magazine surveyed a large group of business analysts and CEOs who rated CEOs on four criteria (Financial World 1975 16):

“(i) During the preceding year, this corporate chief so managed his company’s affairs that it was among the leaders in standard analytic measurement tools of performance. Given the limitation of the economy in general and his industry in particular, his company was able to effect a high rate of return on investment capital, a big increase in net income, best management of debt, etc.

(ii) The executive so managed his company that it increased its position in the field significantly or maintained its position in spite of general adversity.

(iii) This chief executive has assembled an effective working team to surround him so that corporate affairs are run smoothly with creativity, innovation and dynamism. Morale in his company is high in response to his leadership.

(iv) This chief executive has not only been responsible for input into his company but has contributed significantly to his industry and/or community and the nation at large.”

All CEOs of companies with more than $100 million in assets or sales were eligible for the award, and between two and three thousand CEOs were considered for this award in a given year. In each industry, analysts and CEOs select three bronze medal award winners on the basis of the above criteria. The bronze medalists in each industry were then grouped within twelve general business categories. Silver medal award winners for each category were selected by research directors at Wall Street’s largest investment houses. Finally, the editors of Financial World chose the single gold medal award winner from the silver medalists.

The fact that three types of medals were awarded raises the issue of how we should code this variable. It would not be meaningful to distinguish between different types of medals used to value stock options (Gerhart & Rynes, 2003) led us to use this valuation methodology in the absence of significantly better valuation methodology.
because there was only one gold medal winner each year and a relatively small number of silver medals. Also, because analysts and CEOs first decided which CEOs will win a medal (of any type) we felt that the most reasonable approach was to measure whether or not each CEO in our sample won a medal of any type during the period of our study. We used this information to construct two variables.

**Medal in Current Year:** This was a dummy variable that measured whether the CEO won any medal in March of the current year, and is used to assess whether certification has a positive impact on performance (hypotheses 1a & 1b) and the immediate effect of winning a medal early in the year on that year's total compensation (hypothesis 2).²

**Medals Won in Previous Five Years:** This variable captures the number of medals a CEO won over the previous five years. This reflects our reasoning that the effects of certification on compensation are likely to extend beyond one year (hypothesis 2). It is also likely that winning multiple medals will increase the impact of certifications on compensation. We interact this variable with performance (both ROE and stock return) in order to test hypothesis 3.

**Control Variables**

- **Company Size:** This variable was defined as the log of the company’s total assets and was obtained from the COMPUSTAT database.
- **Institutional Ownership:** We defined this variable as the percentage of outstanding stock held by institutional investors as identified in the First Call database.
- **Industry Return:** We defined a firm’s industry as all companies that were in a firm’s two-digit SIC code. While SIC codes can range from one to seven digits, past research has found that

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² Because winning a medal is in part determined by prior financial performance, it is possible that medal winners are primarily benefiting from a financial "halo" (Brown & Perry, 1994). In analyses not reported here we used Brown and Perry's halo removal methodology on both our medal measures and re-ran our analyses. The results were substantively unchanged. For ease of interpretation we report results here using the unmodified measures.
the two-digit level captures most of the systematic industry variation in stock prices (Alford, 1992; Clarke, 1989). Moreover, past research suggests that corporate boards make performance comparisons at the two-digit level (e.g., Antle and Smith, 1986; Gibbons and Murphy, 1990; Porac Wade & Pollock, 1999). A company’s total assets for the current year were used to weight the current year’s performance\(^3\). Industry performance was calculated each year using the formula \(\sum_{ij} \left( \frac{\text{Total Assets}_{ij} \times \text{Total Return}_{ij}}{\sum_{ij} \text{Total Assets}_{ij}} \right)\) where \(i\) indicates each company in industry \(j\) for a given year. These data were obtained from COMPUSTAT.

**CEO Tenure:** How long a CEO has been on the job obviously will influence whether observers attribute a firm’s past performance to that CEO’s ability. To control for these effects, CEO tenure was calculated as the number of years the CEO had been in his present position. These data were obtained from firm proxy statements, *Who’s Who in Finance and Industry,* and *Forbes*’ annual survey of executive compensation.

**Outside CEO:** When CEOs are appointed from outside the firm, they may be more visible and may also receive higher compensation than internally promoted CEOs. In order to control for these effects, and outsider dummy variable was coded 1 if the difference between the CEO’s organizational tenure and positional tenure was less than or equal to three. We chose the three year difference because outside successors are frequently brought into a company at a rank below that of CEO and groomed for one or more years before becoming CEO. This process allows the new CEO to become familiarized with all aspects of the company, and for the board and departing CEO to evaluate the new CEO’s potential prior to his appointment.

**New CEO:** If an individual is promoted from a lower level position to CEO during the course of a year, his or her pay will be prorated based on the amount of time he/she spent in each

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\(^3\) We also calculated a measure using a company’s total assets for the previous year and the results of our analysis
position during that year. Thus, CEOs appointed in the current year would have lower levels of compensation because they spent part of the year in a lower position. In order to control for the effects of mid-year promotions on base and bonus compensation, a dummy control variable was created and coded one if promotion to CEO had occurred sometime during the current year. We also reran our analyses excluding “new” CEOs and the results did not change substantively.

**Year Dummies.** Dummy variables for the years 1992-1996 were also included in the models to control for any period effects in our time series. For instance, year dummies will control for changes in general economic conditions from year to year.

**Method**

**Event Study**

In order to measure the immediate performance effects of winning a medal we performed an event study. Event studies have been commonly used by finance researchers since the early 80s (MacKinlay, 1997) and have more recently been employed by management researchers (see for instance, Arthur & Cook, 2004; Johnson et al., 2005; Sanders & Boivie, 2004). If investors believe that winning a medal conveys new information about the quality of the CEO and his/her ability to positively influence the future cash flows of the firm, one would expect a positive stock market reaction in the days following the announcement. In event studies one must first identify the timing of the event of interest. Using either a financial market model or a market index, expected returns are then calculated for each firm. Each firm’s expected return is then subtracted from its actual return. These differences are known as excess (unexpected) returns and reflect the extent to which the event provided new information about the value of the firm (Brown & were substantively unchanged.
Finally, statistical tests are performed to determine whether these excess returns are significantly different from zero over a specified time window.

We used two approaches to calculate the expected returns provided by the Eventus program available on the Wharton Research Data Services website. In the first method we used the market model, which uses regression analysis to relate a firm’s return to that of the market portfolio (in this case, the S&P 500 index). Using daily returns we estimated a regression equation over the estimation period (ending 46 days before the event and extending back to 2554 days prior to the event) which predicted each firm’s returns. Estimation periods generally end before the event of interest so that the returns at the time of the event will not influence the model parameters. We then used the resulting regression coefficients and the firm's actual daily returns to compute abnormal returns for each firm over each day of the event period. The second common approach in event studies is to calculate a market adjusted return by subtracting the return of the market during each day of the event period from the firm’s daily returns. We used the resulting excess returns ($ER_{it}$) provided by each method to calculate the average daily excess returns ($AER_t$) by summing up the average excess returns over the event window. Following previous event study research, we then used the t statistic to assess whether these excess returns were significantly different than zero (Brown & Warner, 1985; MacKinlay, 1997).

In event studies determining the exact timing of the event is critical since new information is likely to be quickly incorporated into firm security prices. We first considered using the publication date of the magazine to determine when information about the award became public. However, magazines are often available prior to this date and the results of such a contest are likely to be made public earlier in order to generate increased interest in the
magazine. As such, we performed a search on Lexis Nexus using a variety of relevant search terms and recorded the earliest date at which the contest results were mentioned. In all cases, these occurred prior to the publication date of the magazine. Since these announcements were often press releases put out by the companies themselves, we believe that our event dates are accurate and reflect when the award information is actually released. In our analyses we will first focus on one, two and three day event windows. One disadvantage of using longer windows is that other unrelated events may be confounded with the event of interest (McWilliams & Siegel, 1997).\textsuperscript{5} We will, however, report the results of supplementary analyses using windows of a longer length.

**Yearly Performance and Compensation**

Because our data extended over five years and we had multiple observations for each firm, a simple ordinary least squares regression is not likely to be appropriate because our observations are not independent. We considered using a random effects model, but in order to be able to do so the coefficients obtained from the random effects model must equal those from the fixed effects model. If this is not the case, it means that the random effects estimator will produce biased results because there is an uncontrolled for correlation between the independent variables and the unit effects. Using a test developed by Hausman (1978), we found that this assumption was violated. Hence, the fixed effects estimator was used.

Estimating a fixed-effects model is equivalent to adding a dummy variable for each firm (Greene, 1993). A fixed effects model controls for constant unmeasured differences across firms that may explain differences in the dependent variables. For instance, because some firms pay

\textsuperscript{4} Typically event studies employ an estimation period of either 255 or 360 days prior to the event. We tested an alternative model that employed the 360 estimation period and our results were substantively unchanged.
very well across all positions, while other firms pay less for comparable positions (i.e., high wage vs. low wage firms), the inclusion of firm dummies is important because it controls for these effects. Fixed effect models are considered conservative because only changes in independent variables within a firm can produce significant effects. Thus, a positive coefficient in these models can be interpreted as signifying that a positive change in an independent variable within a firm will cause a positive change in the dependent variable within that firm. As we will discuss below in our results section, we also employed several other time series methodologies to check the robustness of the findings from our fixed effects models.

Industry dummies are not included in the time series models because firm effects control for variance due to industry membership, as industry membership is constant across each firm during the time period studied. In all of our analyses we excluded CEOs who had joined the firm in the current year since they could not be held responsible for the prior year’s performance. Unless otherwise noted all of our independent variables are lagged one year prior to our dependent measures. For example, in our models we used performance in 1991 to predict 1992 total compensation.

RESULTS

The list of medal winning CEOs in our sample contains many of the most well known and respected CEOs in the US (e.g., Jack Welch, Lawrence Bossidy, Stanley Gault, etc.). The entire list of medal winners is available from the authors. Table 1 presents descriptive statistics for each of the variables that we measured as well as their bivariate correlations.

[Insert Tables 1 and 2a-c about Here]

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5 Even in our three day window nineteen observations had confounding events, such as earnings announcements, new product introductions, etc. However, excluding these observations did not substantively change the results of any of our event study analyses, so all observations were retained for the analyses reported here.
Firm Performance.

Tables 2a and b present the results of our event study and show the excess returns associated with winning a medal. In table 2a, we first examine cumulative excess returns in the 3 days prior to the announcement of the awards (days -3 to -1) and find that these returns are not significant, suggesting that the information did not leak out to the market before the announcement date. Although they are not shown here, we also calculated event windows that extended 6 days, two weeks and 30 days prior to the event and found no significant effects.

During the event windows subsequent to the announcement, however, we do find evidence that there is a positive stock market reaction. The cumulative excess returns calculated using both the market model and market adjusted returns are positive and significant for the intervals from zero to two days and zero to three days. The cumulative excess returns for the period between the day of the event and one day after (0,1) are positive and marginally significant using the market model but are highly significant when cumulative market adjusted excess returns are used. We also calculated binomial Z statistics which test “whether the proportion of positive to negative returns exceeds the number of expected from the market model (McWilliam & Siegel, 1997: 635).” Using the Z statistic, we once again found statistically significant positive abnormal returns in the days following certification.

In order to investigate these effects further, we examined the daily excess returns from three days before to three days after the event. Table 2b shows that the excess returns are positive and significant 1 day after the event using both the market model and market adjusted returns. And the results using both approaches are quite similar in that the returns one day after the event are .25% using the market model and .26% when market adjusted excess returns are calculated. Two days after the event, only the excess returns calculated using market adjusted
returns are significant although the excess returns calculated using the market model are positive and close to significance. Overall our results suggest these awards are viewed favorably by the market. In general, the strongest effect occurs one day after the announcement and fades thereafter as the information is integrated into investors’ evaluation of the firms.⁶

In order to investigate the longer term effects of certification, we ran additional event studies over a longer window. Table 2c shows the cumulative excess returns associated with winning a medal using a window extending from the third day after the certification to 30 days, 90 days, 180 days and 240 days later. Using the market model, we find in the 30 day window that the cumulative excess return becomes negative (-1.13%) and marginally significant. This negative return increases to -8.23% by day 240 and is highly significant. Combined, these results suggest that while the immediate effect of winning a medal is positive, over time this trend reverses and becomes negative. In contrast, however, the market adjusted model shows no negative long term effects. The excess returns, while insignificant, are positive.

One reason for the difference between these two results may be a function of how excess returns are calculated using each approach. Recall that in the market model a firm’s sensitivity to the return of the market is determined by regressing market returns on a firm’s actual returns during a period prior to the event window. Excess returns are then calculated by subtracting this expected return from the firm’s actual returns during the event window. Essentially, this means that excess returns using the market model are adjusted according to how the firm has responded to the market in the past and its risk profile. In the market adjusted return model, a firm’s prior sensitivity to the market is not taken into account. Excess returns are calculated by simply

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⁶ One possible source of bias in our method is that our events are clustered on specific event dates (e.g. when the awards are announced each year). While Brown and Warner (1985) provide evidence that this generally does not affect the results when using daily data, we re-estimated our excess returns over these event windows using the grouping option in Eventus which clusters the returns and our short term returns did not change.
subtracting the average return from the S&P500 over the event period from a firm’s actual returns. Unlike the market model, the same expected return (that of the S&P500) will be used for all firms. Our long-term results may suggest that while the firm is not doing worse than the average S&P500 firm (market adjusted returns), it is doing poorer than expected based upon its own past history as measured by the market model.

[Insert Table 3 about Here]

As we noted earlier, the results from using longer event windows are only suggestive because of both the distributional assumptions required and the fact that other events are likely to influence performance during a longer event window. Table 3 presents fixed effect models that examine whether CEO certifications are associated with lower or higher firm performance in the subsequent year to test hypothesis 1. In some sense, the fixed effects model is similar to the market model because it measures within firm variation. While the market model compares current performance to what would be expected given the firm’s past sensitivity to the market, the fixed effects model examines how winning a medal changes performance within a firm. In this instance, a medal could still have a negative effect even if the firm performed better on average than other firms over the time period if its within firm performance declined. Model 1 presents our control model predicting yearly market returns. In model 2, we add whether the CEO won a medal at the beginning of the current year and the number of medals won over the previous five years. We find no support for Hypothesis 1a in that winning a medal is not positively associated with future market performance, but we do find some support for hypothesis 1b in that winning a medal is negatively associated with a firm’s market return. In fact, Model 2 shows that a firm whose CEO received a medal at the beginning of the year had
lower market performance during that same year. Using an F test we also find that the increase in $R^2$ between our best fitting model 2 and our base model 1 is significant.

One possible problem with this model is that we did not control for prior performance, which is almost certain to be causally related to winning a medal. Because high performers are also more likely to be medal winners, the negative effect of certification in model 2 may be due to regression to the mean. In order to investigate this further, we estimate a dynamic model which includes a lagged dependent variable. However, including a lagged dependent variable in a standard fixed effects equation is problematic because the error term will almost certainly be correlated with the lagged endogenous variable. In order to obtain consistent estimates, we use the model developed by Arellano and Bond (1991) which uses the generalized method of moments (GMM). As can be seen in model 3, we continue to find that winning a medal at the beginning of the current year has a negative impact on performance, once again offering support for hypothesis 1b. In models 4 and 5, we explore whether winning a medal has an impact on accounting performance but find no effects. Although it is not shown here, we estimated a model predicting ROE with a lagged dependent variable using the Arellano-Bond approach, but the results were the same. In sum, these results suggest that, while the market has an initial positive reaction to CEO certification, longer-term there is a negative relationship between CEO certification and market performance, and no relationship between CEO certification and subsequent accounting performance over the following year. Therefore, hypothesis 1a is supported only in the case of short term excess returns. Hypothesis 1b receives partial support in that winning a medal was negatively associated with annual market returns and one measure of longer term excess returns, while it was unrelated to future accounting performance.

[Insert Table 4 about Here]
CEO Compensation

Table 4 presents the results of analyses that examine the relationship between CEO certification and the total compensation received by a CEO during the year. Model 1 presents the effects of the controls, and model 2 adds the two medal winning measures. Both of these certification measures have positive and highly significant effects, indicating strong support for hypothesis 2. Winning a medal in the current year increases a CEO’s pay by approximately 10% and each medal awarded in the previous five years adds almost 5% to his/her total pay.

In model 3 we test hypothesis 3 by interacting medals won in the past with firm performance as measured by return on common equity. While the main effect of winning medals in the previous five years is no longer significant, the interaction is highly significant and in the expected positive direction. This supports Hypothesis 3 for accounting performance. The lack of a main effect for certification means that winning medals has a positive effect on a CEO’s pay when accounting performance is above zero but a negative effect when it is less than zero. Because an ROE of zero is at the 11th percentile in our sample, this finding suggests that, in order to benefit from certification, the hurdle that must be cleared by a CEO who has won one or more medals in the previous five years is quite low. In Model 4, we investigate whether Hypothesis 3 holds for market performance. While there is a weak positive effect of winning medals in the past on total pay, the interaction with subsequent market performance is not significant. Although it is not shown here, we entered the interaction terms for both accounting and market performance together in another model. Only the interaction between winning medals in the past five years and accounting performance is significant, suggesting that Model 3 is our best fitting and most parsimonious model. It is also worth noting that the effects of being a
current medal winner are robust and positive across all specifications\(^7\). Using an F test we also find that the increase in \(R^2\) between our best fitting model 3 and model 1 is significant.

Because panel pay data within a firm are often correlated across years, it is possible that the disturbances could be correlated across periods and that autocorrelation could be affecting our results. More specifically, if unobserved properties of a firm are gradually changing across years, these would not be captured in our fixed effects models since such models only control for variables that do not change across years within a firm. In order to assess the robustness of our findings, we re-estimated our best fitting model 3 using a relatively new class of robust estimators known as generalized estimating equations (GEE) (Liang & Zerger 1986). An advantage of this approach is that it analyzes both within and between firm variations, unlike the fixed effects model which only examines changes within a firm.

In GEE models one must choose a distribution for the dependent variable, a link function to relate the outcome to the dependent variables, and a specification of the “working” within-firm correlation matrix. Using the XTGEE routine in STATA 8.0 we chose a Gaussian (normal) distribution and an identity link function which corresponds to a linear model. For the correlation matrix, we assumed that there was a first order autoregressive disturbance (AR1) in which disturbances from the prior period for a firm are correlated with disturbances in the current period. Robust standard errors were calculated using the Huber (1967) and White (1982) estimator. In model 5 we re-estimate model 3 using this approach. As can be seen, all of our results are robust to this specification.

\(^7\) We also tried interacting winning a medal in the current year with past performance but it was not significant. In supplementary analyses, we also interacted winning medals in the past with winning a medal in the current year. We found that this interaction had a marginally significant (\(p<.10\)) negative effect suggesting that the impact of winning a new medal on compensation is attenuated if the CEO has won in the past. All of our results remained robust to this specification.
We also performed additional sensitivity analyses. Recall that our selection criterion for CEOs was that they were appointed to their position by the end of October in the current year. In addition, the focal CEO had to be at the firm in some capacity in the previous year. In 23 cases where our focal CEOs started during the current year, the prior CEO had won a medal and subsequently left the firm. It is unclear what the effect of such medals would be since these CEOs generally left the firm at the end of the prior year or early in the current year. Conceivably, the effect of such medals could even be negative since the star CEO had left the firm. We found no separate effect of these medals in our event analysis, and when we pooled them with winners that did stay with the firm our results did not change. In our panel analyses of performance and compensation, we also tried including a dummy variable indicating that the previous CEO had won a medal but it was not significant. Finally, we dropped all new CEOs that started in the current year from our sample as well as those that were at the firm less than six months during the previous year and our results remained robust.

DISCUSSION

Although previous research has established that certification contests can have powerful effects on organizations by influencing organizational-level legitimacy and status (Rao, 1994), our study examines the effects of certification on individuals in the corporate governance arena. We used the annual results of Financial World’s CEO of the Year competition as an indicator of the general opinion about CEO abilities among analysts and peers. We examined the influence of being certified as a star CEO on both organizational performance and CEO compensation. Our results suggest that stockholders value, at least initially, the certification of CEOs as evidenced by the positive abnormal stock returns that immediately follow the announcement of the awards. And yet, these effects quickly fade and appear to become negative over the subsequent months.
Our confidence in these longer term negative effects is reinforced by our regression analyses showing the relationship between medals and yearly returns is negative even after controlling for prior returns. Our results also suggest that being certified does not seem to be associated with either higher or lower one year accounting profits of the recipient’s firm.

At the same time, being certified had a positive effect on the recipient’s compensation, over and above any performance differences that might exist between winners and non-winners. If a CEO’s compensation partially reflects the extent to which a company’s directors value a CEO’s abilities and contributions, this result suggests that certification does indeed heighten the tendency of boards to attribute special competencies to the CEO. It appears from our data that this attribution then leads the board to set up an evaluative “gauntlet” for the CEO in subsequent years as certification has a positive impact on compensation as long as ROE remains positive. If a company achieves a negative ROE, star CEOs receive lower total compensation than non-medal winning CEOs for an equivalent level of performance. This gauntlet is not very severe, however. The performance inflection point is at the 11th percentile of performance in our sample, suggesting that profitability need not be very high in order for CEOs to capitalize on their celebrity status.

This general pattern of results suggests a more nuanced representation of the effects of CEO certification on firm and individual outcomes than is suggested by our original hypotheses and the prior research literature. One obvious subtlety is the difference between profitability and stock returns as measures of firm performance. Our results indicate that profitability is insensitive to CEO certification, suggesting that star CEOs have neither a positive nor negative effect on the operating results of the firm, at least over the one year time window that we used in our analyses. Our five years of panel data do not allow us to analyze rigorously multi-year
lagged relationships without losing large numbers of observations, so our results are inconclusive regarding any longer term profitability effect.

However, the lack of one-year results is suggestive and theoretically important given the concomitant effects of certification on both immediate and one year market returns. If CEO certification has no short-term effect on the profitability of a company, then winning a medal can only be, at best, a noisy signal regarding the relationship between managerial ability and longer term profitability. And yet, our results indicate that both investors and company boards respond immediately, and over the course of the year, to this signal in predictable ways. Similar to the effects observed by Sanders and Boivie (2004) in their study of governance practices on IPO underpricing, investors initially bid up the price of company stock after learning about a CEO medal. However, shortly afterward they reverse course and bid the price down. Over the course of the year, firms with medal-winning CEOs thus had lower cumulative market returns than firms with non-medal winners at the helm. It is important to note that this reversal cannot be explained by regression to the mean from the previous year’s stock performance, since we controlled for prior market returns in our analyses. Company boards seem to respond quickly to CEO certification as well, since our results show that winning a medal increases a CEO’s total direct compensation that year by about 10%. They also continue to respond to certification over the course of the following year by paying medal winners more than non-medal winners when their firms continue to be profitable while paying them less when their firms are not profitable.

One possible explanation for this more nuanced pattern of data is that certification does indeed create a burden of celebrity in that while certification is immediately received positively by shareholders and boards, it may also then lead to heightened expectations about future performance. Our results suggest that simply maintaining a certain level of performance may not
be sufficient for shareholders of firms with celebrity CEOs. Firms that employ star CEOs seem to have a higher expectational hurdle to meet in order to be valued positively by the market. This reflects the idea that reputations are not only an asset but also can be a burden as star CEOs must carefully manage their firms’ actions going forward or risk losing their status and investor goodwill. While boards of directors seem to be more lenient in their expectations, they do respond more negatively to lower profitability when a star CEO is involved. In the eyes of both investors and boards, then, star CEOs may very well create the seeds of their own devaluation because “the reputations they earn from doing some things particularly well sit on the slippery ground of their constituents’ fickle interpretation” (Fombrun, 1996: 388).

We did not find that overconfident star CEOs undermined short-term profitability, although the negative stock returns that we observed could conceivably imply that investors were anticipating lower profitability in the future due to executive decisions that they perceived as risky. So, we cannot rule out CEO hubris as a possible influence on our performance results. In addition, CEO hubris is a plausible explanation for our results regarding the relationship between subsequent firm profitability and CEO compensation. We have suggested that CEO certifications may encourage compensation committees to attribute responsibility for company outcomes to the CEO. Thus, certified CEOs whose companies perform well are rewarded handsomely while poor performers are penalized. Yet, in many cases a CEO’s compensation is partially dependent on meeting performance targets that are set at the beginning of the year in the course of discussions between the board and the CEO. Because of the generalized attribution, perhaps shared by the CEO, that a star CEO can have a bottom-line impact on future company performance, the formulas that determine the amount of incentive compensation awarded at the end of the year may be much more sensitive to the firm’s subsequent performance than the
criteria used to evaluate lesser known managers. By this reasoning, a board’s attribution that a
star CEO can influence the performance of their firm plays out in a tighter performance-
compensation linkage. Celebrated and visible CEOs with a record of accomplishment may very
well agree to this tighter linkage because they have confidence in their own abilities to affect
their firm’s future profitability in positive ways. Certifications may essentially create the belief
among board members and the CEO that the CEO’s success is sustainable. If the firm’s
subsequent performance is poor, however, it will be more difficult for an overconfident star CEO
to modify previously agreed upon targets and to change the “rules of the game."

These expectational effects on star CEO compensation have interesting implications for
agency arguments regarding the monitoring and control of managerial activities (e.g., Fama,
1980; Jensen & Meckling, 1976). Barkema and Gomez-Mejia (1998) noted that fifty years of
scholarship have identified weak, and often contradictory, findings regarding traditional agency
theoretic arguments that shareholder disciplining mechanisms must be used to align executive
incentives with corporate performance. Our findings suggest an alternative governance
mechanism that is based on the attributions of managers and boards of directors rather than on
organizational constraints imposed by outsiders. Because controlling mechanisms rooted in CEO
performance attributions are internally imposed by the CEO rather than externally imposed by
shareholders, CEO certifications may supplement traditional governance mechanisms by
inducing attributions of competence that evolve into expectations for higher performance.
Disciplining mechanisms that are partially endogenous to how CEOs and boards explain the
performance of their companies have been largely ignored in the corporate control literature. Our
results suggest that exploring such mechanisms more fully may be a fruitful line of future
research into manager-shareholder alignment.
Overall, our results provide cautionary information for corporate pay policies. Given that CEO certifications do not appear to have a short-term beneficial effect on future profitability, the argument that boards of directors should pay exorbitant levels of compensation to attract and retain star CEOs whose firms have performed well in the past may be somewhat misplaced, especially given the heightened investor expectations that also seem to come with star status. However, boards of directors might be able to mitigate these costs by making pay more dependent on future performance. In this way, companies can reduce the degree to which they "overpay" for star CEOs when actual corporate performance fails to meet expectations. Ironically, the overconfidence that past success creates may provide an endogenous mechanism through which boards can attenuate the winner-take-all effect identified by Frank and Cook (1995). Of course, one limitation of our study is that we cannot distinguish whether the greater sensitivity of pay to performance for certified CEOs results from boards holding star CEOs more responsible for firm outcomes or from star CEOs agreeing to more demanding compensation contracts. We suspect that both of these processes are probably occurring simultaneously. However, qualitative or survey research that delves more deeply into the black box surrounding compensation setting would be useful in untangling these dynamics more completely.

The disciplining effect of the burden of celebrity that we observed in the present study has been largely overlooked in previous research on organizational certification and status rankings. Although we observed this effect at the level of individual CEOs, it is likely that the burden of celebrity influences the dynamics of organizational certifications as well. For example, Elsbach and Kramer (1996) studied the impact of the annual ranking of US business schools published by *Business Week* magazine and found that the introduction of this ranking scheme in 1988 was a highly significant event that triggered a great deal of retrospective sensemaking and
self attributions among school administrators, students, and faculty. Our results would lead one to expect that being certified as a star business school brings with it not only pride and prestige, but also the risks involved in expecting that a school’s star status is sustainable over the long run. To the extent that ranking criteria are somewhat unpredictable, any given school’s ranking will vary from year to year. We would argue that the negative effects incurred because of a decline in a school’s ranking from one year to the next would be particularly felt by those schools that are highly ranked, since the burden of celebrity falls particularly hard on their shoulders. This might explain anecdotal observations that faculty, students, and administrators from highly ranked schools respond much more actively and negatively to a decline in their ranking than do personnel from lesser ranked schools. Future research might explore the self-disciplining dynamics of organizational certifications more completely.

Future research might also consider the effect of certification on CEOs when they switch firms. It would be consistent with our theoretical framework that when star CEOs move they receive a pay premium or receive more structural power upon accepting a job at a different firm. Certification contests might be an important source of information about a CEO, since the boards doing the hiring may not have much direct experience with the individual. As such, winning a certification contest may be an even stronger signal to the labor market outside of the CEO’s own firm. Future research may also consider whether certification has an impact on other top management team members. Top management team members who have worked for celebrity CEOs may be paid compensation premiums or be more likely to be hired as CEOs at other firms. Then again, team members who move into other CEO positions elsewhere may face very high expectations and have a shorter “honeymoon” period. Exploring these research questions will help shed light on where, and how brightly, a celebrity CEO’s star shines.
References


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<td>.09</td>
<td>.06</td>
<td>-.30</td>
<td>.03</td>
<td>-.41</td>
<td>.02</td>
<td>-.03</td>
<td>.02</td>
<td>.02</td>
<td>.03</td>
<td>-.25</td>
<td>-.25</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>1996 Dummy</td>
<td>16</td>
<td>0.20</td>
<td>0.40</td>
<td>-.03</td>
<td>-.05</td>
<td>.20</td>
<td>.00</td>
<td>.19</td>
<td>.05</td>
<td>.20</td>
<td>.03</td>
<td>-.04</td>
<td>-.03</td>
<td>.10</td>
<td>-.03</td>
<td>-.25</td>
<td>-.24</td>
<td>-.24</td>
<td>1.00</td>
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</table>
### TABLE 2a
Excess Market Returns Surrounding the Announcement of Medals

<table>
<thead>
<tr>
<th>Days</th>
<th>Market Model</th>
<th></th>
<th>Market Adjusted Model</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N8</td>
<td>Abnormal Return</td>
<td>t</td>
<td>Abnormal Return</td>
</tr>
<tr>
<td>-3 to -1</td>
<td>186</td>
<td>-0.17%</td>
<td>-0.839</td>
<td>-0.04%</td>
</tr>
<tr>
<td>0 to +1</td>
<td>186</td>
<td>0.28%</td>
<td>1.66*</td>
<td>0.38%</td>
</tr>
<tr>
<td>0 to +2</td>
<td>186</td>
<td>0.47%</td>
<td>2.30**</td>
<td>0.64%</td>
</tr>
<tr>
<td>0 to +3</td>
<td>186</td>
<td>0.49%</td>
<td>2.06**</td>
<td>0.69%</td>
</tr>
</tbody>
</table>

*= p<.10, **=p<.05, ***=p<.01

### TABLE 2b
Daily Abnormal Market Returns Surrounding the Announcement of Medals

<table>
<thead>
<tr>
<th>Day</th>
<th>Market Model</th>
<th></th>
<th>Market Adjusted Model</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>Abnormal Return</td>
<td>t</td>
<td>Abnormal Return</td>
</tr>
<tr>
<td>-3</td>
<td>186</td>
<td>-0.04%</td>
<td>-0.38</td>
<td>-0.01%</td>
</tr>
<tr>
<td>-2</td>
<td>186</td>
<td>-0.01%</td>
<td>-0.07</td>
<td>0.05%</td>
</tr>
<tr>
<td>-1</td>
<td>186</td>
<td>-0.12%</td>
<td>-1.01</td>
<td>-0.08%</td>
</tr>
<tr>
<td>0</td>
<td>186</td>
<td>0.03%</td>
<td>0.28</td>
<td>0.13%</td>
</tr>
<tr>
<td>1</td>
<td>186</td>
<td>0.25%</td>
<td>2.06**</td>
<td>0.26%</td>
</tr>
<tr>
<td>2</td>
<td>186</td>
<td>0.20%</td>
<td>1.65*</td>
<td>0.25%</td>
</tr>
<tr>
<td>3</td>
<td>186</td>
<td>0.02%</td>
<td>0.13</td>
<td>-0.06%</td>
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</table>

*= p<.10, **=p<.05, ***=p<.01

### TABLE 2c
Long Term Excess Market Returns Surrounding the Announcement of Medals

<table>
<thead>
<tr>
<th>Days</th>
<th>Market Model</th>
<th></th>
<th>Market Adjusted Model</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>Abnormal Return</td>
<td>t</td>
<td>Abnormal Return</td>
</tr>
<tr>
<td>3 to 30</td>
<td>186</td>
<td>-1.13%</td>
<td>-1.79*</td>
<td>0.14%</td>
</tr>
<tr>
<td>3 to 90</td>
<td>186</td>
<td>-3.36%</td>
<td>-3.01***</td>
<td>0.70%</td>
</tr>
<tr>
<td>3 to 180</td>
<td>186</td>
<td>-7.07%</td>
<td>-4.45***</td>
<td>0.88%</td>
</tr>
<tr>
<td>3 to 240</td>
<td>186</td>
<td>-8.23%</td>
<td>-4.48***</td>
<td>2.38%</td>
</tr>
</tbody>
</table>

*= p<.10, **=p<.05, ***=p<.01

---

8 The number of medals in the event study does not equal the number of medals in the sample because the event study program we use (EVENTUS) did not have stock performance history for every company. As such, our sample of medal winners was reduced from 195 to 186.
<table>
<thead>
<tr>
<th>Variable</th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3&lt;sup&gt;10&lt;/sup&gt;</th>
<th>Model 4</th>
<th>Model 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Performance</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ROE</td>
<td>-0.418*** (0.050)</td>
<td>-0.411*** (0.050)</td>
<td>-0.447*** (0.107)</td>
<td>0.060*** (0.022)</td>
<td>0.060*** (0.022)</td>
</tr>
<tr>
<td>Market Return</td>
<td></td>
<td></td>
<td></td>
<td>0.060*** (0.022)</td>
<td>0.060*** (0.022)</td>
</tr>
<tr>
<td>Ln Total Assets Lagged</td>
<td>-4.866 (4.276)</td>
<td>-5.060 (4.261)</td>
<td>-3.191 (6.180)</td>
<td>-6.304** (3.542)</td>
<td>-6.306** (3.529)</td>
</tr>
<tr>
<td>Industry Return</td>
<td>0.441*** (0.065)</td>
<td>0.443*** (0.065)</td>
<td>0.385*** (0.124)</td>
<td>0.036 (0.054)</td>
<td>0.036 (0.054)</td>
</tr>
<tr>
<td>CEO Tenure</td>
<td>0.122 (0.240)</td>
<td>0.127 (0.246)</td>
<td>0.192 (0.304)</td>
<td>-0.169 (0.196)</td>
<td>-0.168 (0.202)</td>
</tr>
<tr>
<td>Institutional Ownership</td>
<td>-89.252*** (15.067)</td>
<td>-88.635*** (15.020)</td>
<td>106.870*** (54.454)</td>
<td>0.886 (12.708)</td>
<td>0.878 (12.714)</td>
</tr>
<tr>
<td>CEO from Outside</td>
<td>11.734*** (3.946)</td>
<td>12.202*** (3.933)</td>
<td>0.383 (6.189)</td>
<td>-1.715 (3.229)</td>
<td>-1.703 (3.234)</td>
</tr>
<tr>
<td>New CEO</td>
<td>2.099 (3.172)</td>
<td>0.567 (3.202)</td>
<td>-1.097 (3.441)</td>
<td>-4.300** (2.595)</td>
<td>-4.349** (2.633)</td>
</tr>
<tr>
<td>1993 Dummy</td>
<td>-0.846 (2.332)</td>
<td>-1.203 (2.328)</td>
<td>10.231*** (3.303)</td>
<td>1.657 (1.978)</td>
<td>1.651 (1.982)</td>
</tr>
<tr>
<td>1995 Dummy</td>
<td>19.035*** (2.573)</td>
<td>18.464*** (2.573)</td>
<td>44.494*** (5.447)</td>
<td>6.039*** (2.285)</td>
<td>6.030*** (2.290)</td>
</tr>
<tr>
<td>1996 Dummy</td>
<td>9.454*** (2.691)</td>
<td>8.789*** (2.689)</td>
<td>36.130*** (5.996)</td>
<td>5.862*** (2.198)</td>
<td>5.842*** (2.207)</td>
</tr>
<tr>
<td>Medal Winner This Year</td>
<td>-8.331*** (2.636)</td>
<td>-11.176*** (2.860)</td>
<td>- (2.860)</td>
<td>-0.257 (2.163)</td>
<td>-0.257 (2.163)</td>
</tr>
<tr>
<td>Medals won in Last Five</td>
<td>-0.208 (1.453)</td>
<td>0.135 (1.578)</td>
<td>(1.578)</td>
<td>-0.034 (1.194)</td>
<td>-0.034 (1.194)</td>
</tr>
<tr>
<td>Years (Medpast)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lagged Market Return</td>
<td>0.161*** (0.050)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>101.370*** (38.026)</td>
<td>104.366*** (37.884)</td>
<td>-5.890*** (1.156)</td>
<td>64.950** (31.214)</td>
<td>65.032** (31.253)</td>
</tr>
<tr>
<td>Observations</td>
<td>1271</td>
<td>1271</td>
<td>955</td>
<td>1268</td>
<td>1268</td>
</tr>
<tr>
<td>R²</td>
<td>.464</td>
<td>.469</td>
<td>.481</td>
<td>.481</td>
<td>.481</td>
</tr>
<tr>
<td>ADJ R²</td>
<td>.307</td>
<td>.313</td>
<td>.330</td>
<td>.329</td>
<td>.329</td>
</tr>
<tr>
<td>Chi²</td>
<td></td>
<td></td>
<td>372.83</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* p<.10, **=p<.05, ***=p<.01

<sup>9</sup> In Tables 3 and 4, firm dummies are included in all fixed effects models but are not shown.

<sup>10</sup> This model uses the Arellano-Bond (1991) approach which uses a lagged dependent variable as an instrument. As a result, the number of observations is smaller because the first year must be dropped. In addition, in a few cases where lagged market returns are unavailable those observations must be dropped.
<table>
<thead>
<tr>
<th>Variable</th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
<th>Model 4</th>
<th>Model 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>ROE</td>
<td>0.001</td>
<td>0.001</td>
<td>0.000</td>
<td>0.001</td>
<td>0.000</td>
</tr>
<tr>
<td></td>
<td>(0.001)</td>
<td>(0.001)</td>
<td>(0.001)</td>
<td>(0.001)</td>
<td>(0.002)</td>
</tr>
<tr>
<td>Market Return</td>
<td>0.001***</td>
<td>0.001***</td>
<td>0.001***</td>
<td>0.001**</td>
<td>0.001***</td>
</tr>
<tr>
<td></td>
<td>(0.000)</td>
<td>(0.000)</td>
<td>(0.000)</td>
<td>(0.000)</td>
<td>(0.000)</td>
</tr>
<tr>
<td>Ln Total Assets Lagged</td>
<td>0.093</td>
<td>0.093</td>
<td>0.108*</td>
<td>0.096*</td>
<td>0.202***</td>
</tr>
<tr>
<td></td>
<td>(0.073)</td>
<td>(0.073)</td>
<td>(0.073)</td>
<td>(0.073)</td>
<td>(0.023)</td>
</tr>
<tr>
<td>Industry Return</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
</tr>
<tr>
<td></td>
<td>(0.001)</td>
<td>(0.001)</td>
<td>(0.001)</td>
<td>(0.001)</td>
<td>(0.001)</td>
</tr>
<tr>
<td>CEO Tenure</td>
<td>0.031***</td>
<td>0.024**</td>
<td>0.022**</td>
<td>0.024**</td>
<td>0.019**</td>
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<tr>
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<td>(0.010)</td>
<td>(0.010)</td>
<td>(0.010)</td>
<td>(0.010)</td>
</tr>
<tr>
<td>CEO Tenure Squared</td>
<td>-0.001***</td>
<td>-0.001***</td>
<td>-0.001***</td>
<td>-0.001***</td>
<td>-0.001***</td>
</tr>
<tr>
<td></td>
<td>(0.000)</td>
<td>(0.000)</td>
<td>(0.000)</td>
<td>(0.000)</td>
<td>(0.000)</td>
</tr>
<tr>
<td>Institutional Ownership</td>
<td>0.458**</td>
<td>0.470**</td>
<td>0.470**</td>
<td>0.445**</td>
<td>0.651***</td>
</tr>
<tr>
<td></td>
<td>(0.269)</td>
<td>(0.268)</td>
<td>(0.268)</td>
<td>(0.269)</td>
<td>(0.228)</td>
</tr>
<tr>
<td>CEO from Outside</td>
<td>0.101*</td>
<td>0.090*</td>
<td>0.086</td>
<td>0.091*</td>
<td>0.171**</td>
</tr>
<tr>
<td></td>
<td>(0.069)</td>
<td>(0.069)</td>
<td>(0.069)</td>
<td>(0.069)</td>
<td>(0.080)</td>
</tr>
<tr>
<td>New CEO</td>
<td>0.052</td>
<td>0.063</td>
<td>0.061</td>
<td>0.063</td>
<td>0.102**</td>
</tr>
<tr>
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<td>(0.058)</td>
<td>(0.059)</td>
<td>(0.058)</td>
<td>(0.059)</td>
<td>(0.057)</td>
</tr>
<tr>
<td>1993 Dummy</td>
<td>0.104**</td>
<td>0.105***</td>
<td>0.102***</td>
<td>0.110***</td>
<td>0.078**</td>
</tr>
<tr>
<td></td>
<td>(0.041)</td>
<td>(0.041)</td>
<td>(0.041)</td>
<td>(0.041)</td>
<td>(0.038)</td>
</tr>
<tr>
<td>1994 Dummy</td>
<td>0.372***</td>
<td>0.377***</td>
<td>0.372***</td>
<td>0.380***</td>
<td>0.350***</td>
</tr>
<tr>
<td></td>
<td>(0.040)</td>
<td>(0.040)</td>
<td>(0.040)</td>
<td>(0.040)</td>
<td>(0.042)</td>
</tr>
<tr>
<td>1995 Dummy</td>
<td>0.444***</td>
<td>0.447***</td>
<td>0.449***</td>
<td>0.449***</td>
<td>0.413***</td>
</tr>
<tr>
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<td>(0.049)</td>
<td>(0.049)</td>
<td>(0.049)</td>
<td>(0.049)</td>
<td>(0.053)</td>
</tr>
<tr>
<td>1996 Dummy</td>
<td>0.574***</td>
<td>0.584***</td>
<td>0.574***</td>
<td>0.586***</td>
<td>0.534***</td>
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<td>(0.045)</td>
<td>(0.046)</td>
<td>(0.046)</td>
<td>(0.046)</td>
<td>(0.044)</td>
</tr>
<tr>
<td>Medal Winner This Year</td>
<td>0.100**</td>
<td>0.099**</td>
<td>0.095**</td>
<td>0.104**</td>
<td>0.045**</td>
</tr>
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<td>(0.045)</td>
<td>(0.045)</td>
<td>(0.045)</td>
<td>(0.045)</td>
</tr>
<tr>
<td>Medals won in Last Five</td>
<td>0.047**</td>
<td>0.000</td>
<td>0.038*</td>
<td>0.038</td>
<td>0.038</td>
</tr>
<tr>
<td></td>
<td>(0.026)</td>
<td>(0.032)</td>
<td>(0.027)</td>
<td>(0.032)</td>
<td>(0.032)</td>
</tr>
<tr>
<td>Years (Medpast)</td>
<td>0.003***</td>
<td>0.003***</td>
<td>0.003***</td>
<td>0.003***</td>
<td>0.003***</td>
</tr>
<tr>
<td></td>
<td>(0.001)</td>
<td>(0.001)</td>
<td>(0.001)</td>
<td>(0.001)</td>
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</tr>
<tr>
<td>Medpast x Return on Equity</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
</tr>
<tr>
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<td>(0.000)</td>
<td>(0.000)</td>
<td>(0.000)</td>
<td>(0.000)</td>
<td>(0.000)</td>
</tr>
<tr>
<td>Constant</td>
<td>6.332***</td>
<td>6.310***</td>
<td>6.189***</td>
<td>6.300***</td>
<td>5.235***</td>
</tr>
<tr>
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<td>(0.647)</td>
<td>(0.645)</td>
<td>(0.645)</td>
<td>(0.645)</td>
<td>(0.267)</td>
</tr>
<tr>
<td>Observations</td>
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<td>1267</td>
<td>1267</td>
<td>1173</td>
</tr>
<tr>
<td>R²</td>
<td>.778</td>
<td>.780</td>
<td>.781</td>
<td>.780</td>
<td>395.88</td>
</tr>
<tr>
<td>ADJ R²</td>
<td>.713</td>
<td>.714</td>
<td>.716</td>
<td>.715</td>
<td>395.88</td>
</tr>
</tbody>
</table>

*= p<.10, **=p<.05, ***=p<.01

11 This model is estimated using generalized estimating equations first proposed by Liang and Zerger (1986) and is implemented using the XTGEE command in Stata. Computing the correlation matrix to adjust for autocorrelation requires that there be no gaps between years within a firm. Thus, firms in which there were missing values between years were dropped.